

SHARP® SERVICE MANUAL

SY209R4G14EHW

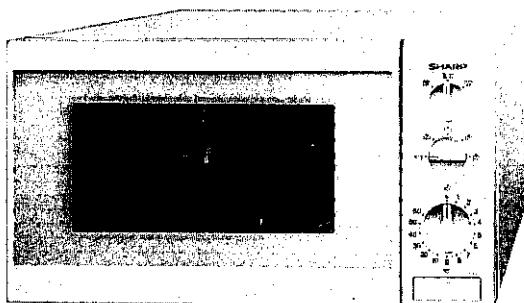


Photo R-4G14(W)

GRILL AND MICROWAVE OVEN

MODELS

**R-4G14(W)
R-4G14(B)**

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

TABLE OF CONTENTS

	Page
CAUTION, MICROWAVE RADIATION	1
WARNING	1
PRODUCT SPECIFICATIONS	2
GENERAL IMPORTANT INFORMATION	2
APPEARANCE VIEW	3
OPERATING SEQUENCE	4
FUNCTION OF IMPORTANT COMPONENTS	6
SERVICING	8
TEST PROCEDURE	10
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE	18
MICROWAVE MEASUREMENT	24
TEST DATA AT A GLANCE	25
WIRING DIAGRAM	26
PICTORIAL DIAGRAM	28
PARTS LIST	29

SHARP CORPORATION



SERVICE MANUAL

SHARP

GRILL AND MICROWAVE OVEN

R-4G14(W) / R-4G14(B)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION MICROWAVE RADIATION

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked ** on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

**SHARP CORPORATION
OSAKA, JAPAN**

PRODUCT SPECIFICATIONS

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT
COMPONENTS

SERVICING AND
TROUBLESHOOTING CHART

TEST PROCEDURE

COMPONENT REPLACEMENT
AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT
TEST DATA AT A GLANCE

WIRING DIAGRAM

PARTS LIST

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	220 - 230 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1550 W Approx. 7.9A Grill cooking 1050 W Approx. 4.5A Dual cooking 2550 W Approx. 12.3A
Grill Heating element Power Output	1000 W (500W x 2)
Power Output	900 watts nominal of RF microwave energy (measured by way of IEC 705) Operating frequency of 2450MHz
Case Dimensions	Width 520 mm Height 305 mm including foot Depth 413 mm
Cooking Cavity Dimensions.	Width 342 mm Height 193 mm Depth 368 mm
Turntable diameter	325mm
Control Complement	60 min. Dual Speed Timer Microwave Power for Variable Cooking Repetition Rate: HIGH Full power throughout the cooking time MEDIUM HIGH approx. 70% of Full Power MEDIUM approx. 50% of Full Power MEDIUM LOW approx. 30% of Full Power LOW approx. 10% of Full Power Cooking mode selector
Set Weight	Approx. 18.0 kg

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHD

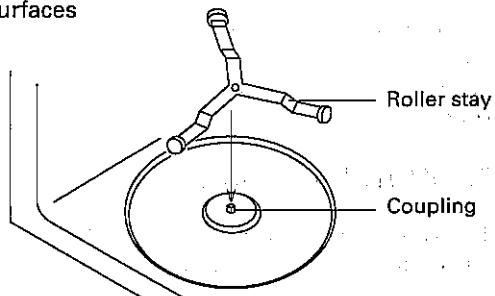
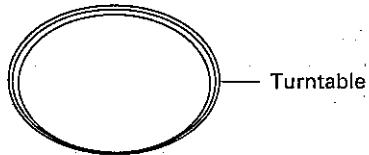
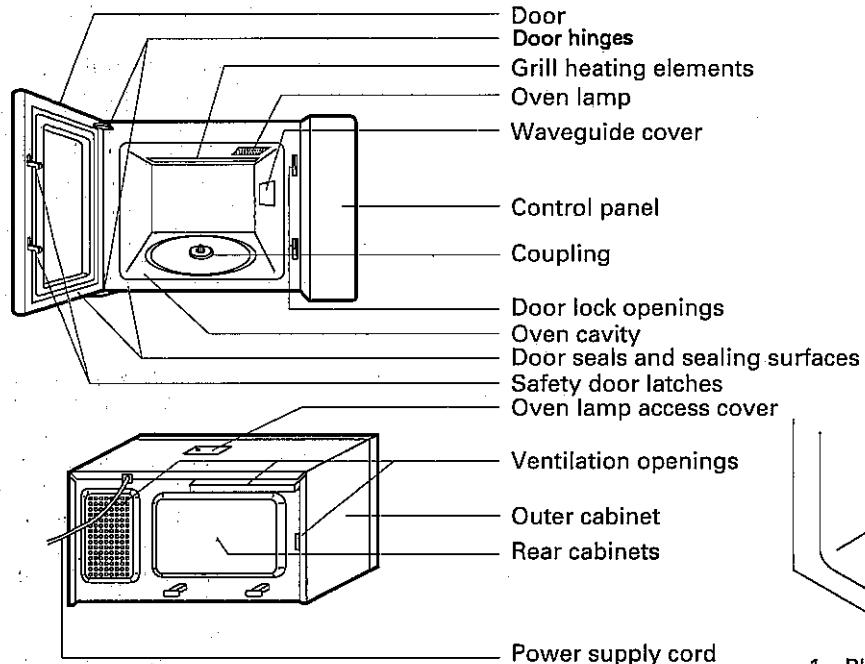
IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

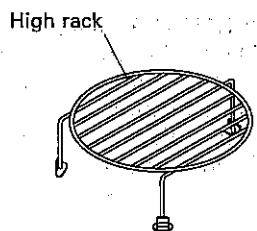
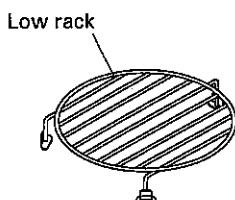
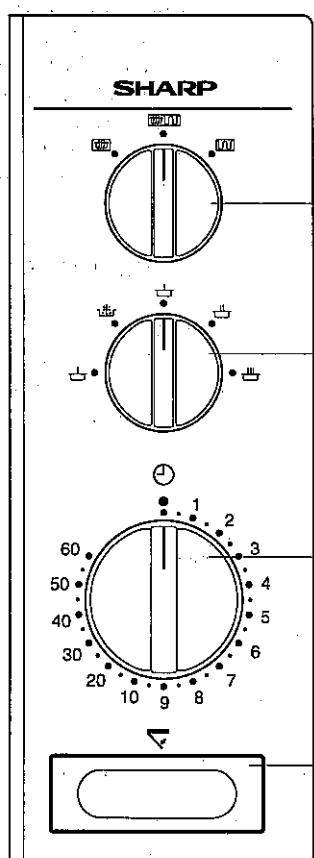
APPEARANCE VIEW

OVEN



1. Place the roller stay on the coupling.
2. Then place the turntable on it.

CONTROL PANEL



OPERATION SEQUENCE

OFF CONDITION

- When the timer knob is at "●", the oven is OFF condition.
- Closing the oven door activates the primary latch switch SW1, 2nd latch switch SW2, and 3rd latch switch SW3

IMPORTANT:

When the oven door is closed, the contacts COM-NC of the monitor switch SW4 must be open.

Figure O-1 on page 26

- When the microwave oven is plugged in a wall outlet (220–230V, 50Hz), the noise filter is energized.
- When the oven door is opened, the oven lamp lights.

MICROWAVE COOKING CONDITION

Set the cooking mode selector to "MICROWAVE". The switches come to the following positions.

Switch	Contact	Condition	Plunger
Micro. select switch	COM-NC	Closed	Not pressed
Grill select switch	COM-NC	Opened	Pressed

HIGH COOKING

When the door is closed, the contacts COM-NO of the primary, 2nd and 3rd latch switches SW1+SW2+SW3 are activated.

When the microwave power control is set to "(HIGH)" position and cooking time is selected by turning the timer, the following operations occur: (Figure O-2)

- The contacts of the timer motor and vari switch are closed.
- Then following components are energized.

O: energized	-: de-energized
Oven lamp	O
Timer motor	O
Turntable motor	O
Surge relay	O

- The line voltage is supplied to the primary winding of the power transformer. The voltage is converted to about 3.3 volts A.C. on the filament winding, and approximately 2000 volts A.C. on the secondary winding.
- The 3.3 volts filament winding voltage heats the magnetron filament and the 2000 volts secondary winding voltage is sent to a voltage doubler circuit, where it is doubled to a negative voltage of approximately DC 4000volts.
- The 2450MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is changed through the waveguide(transport channel) into the oven cavity, where the food is placed to be cooked.
- Upon completion of the selected cooking time, the timer bell rings, and contacts of the timer are open,

then the activated components as item 2 are de-energized.

- When the door is opened during a cooking cycle, the switches come to the following positions.

Switch	Contact	During Cooking	Oven door open (No Cooking)
Primary latch switch	COM-NO	Closed	Opened
2nd latch switch	COM-NO	Closed	Opened
3rd latch switch	COM-NO	Closed	Opened
Monitor switch	COM-NC	Opened	Closed

- Monitor switch circuit

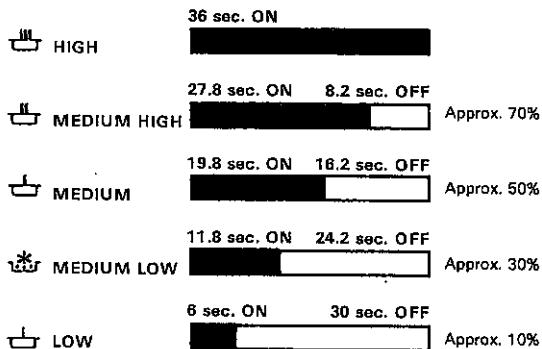
The monitor switch SW4 is mechanically controlled by the oven door and monitors the operation of the primary latch switch SW1.

- When the oven door is opened during or after a cooking cycle, the primary latch switch SW1 and the 2nd latch switch SW2 must open their contacts (COM-NO) first. After that the contacts (COM-NC) of the monitor switch SW4 can be closed, and the contacts (COM-NO) of the 3rd latch switch SW3 are opened.
- When the oven door is closed, the contacts (COM-NC) of the monitor switch SW4 must be opened, and the contacts (COM-NO) of the 3rd latch switch SW3 are closed.
- When the oven door is opened and the contacts (COM-NO) of the primary latch switch SW1 remains closed, the fuse F8A F1 will blow, because the contacts (COM-NC) of the monitor switch SW4 are closed and a short circuit is caused through the primary latch switch SW1, the monitor resistor R1, monitor switch SW4, and the fuse F8A F1.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, The line voltage is supplied to the power transformer intermittently within a 36-second time base through the vari contact. The following levels of microwave power are given.

SETTING



Note: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power,

because approx. 2 seconds are needed for heating up the magnetron filament.

GRILL COOKING CONDITION

Set the cooking mode selector to "GRILL". The switches come to the following positions.

Switch	Contact	Condition	Plunger
Micro. select switch	COM-NC	Opened	Pressed
Grill select switch	COM-NC	Closed	Not Pressed

When the cooking time is set by turning the timer, the following operations occur:

Fugure O-3 on page 27

1. The contacts of primary latch switch SW1, 2nd latch switch SW2 and 3rd latch switch SW3 are closed.
2. Then the following components are energized.

Grill heating elements	Timer motor
Turntable motor	Fan motor
Oven lamp	

3. Now the food is cooked.
4. Upon completion of the select cooking time, the timer bell rings, and contacts of the timer are opened, then the activated components as item 2 are de-energized.

DUAL COOKING

(MICROWAVES and GRILL) CONDITION

In this condition, the food is cooked by both microwave energy and grill heating elements energy simultaneously.

Set the cooking mode selector to "DUAL COOK". The switch conditions are as follows:

Switch	Contact	Condition	Plunger
Micro Select Switch	COM-NC	Closed	Not pressed
Grill Select Switch	COM-NC	Closed	Not pressed

You can select the microwave power levels. When the cooking timer is set by turning the timer, the following operations occur.:

Figure O-4 on page 27

1. The contacts of primary latch switch SW1, 2nd latch switch SW2 and 3rd latch switch SW3 are closed.
2. Then Following components are energized.

Power transformer	Grill heating elements
Surge relay	Turntable motor
Magnetron	Timer motor
H.V. capacitor	Fan motor
H.V. rectifier	Oven lamp

3. Now the food is cooked by microwave and grill heating elements energy simultaneously.
4. Upon completion of the selected cooking time, the timer bell rings, and contacts of the timer are opened, then the activated components as item 2 are de-energized.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the door open button on the control panel. When the door open button is pushed, the cook lever is moved upward, operating the latch head. The latch head is moved upward, and released from the latch hook. Now, the door can be opened.

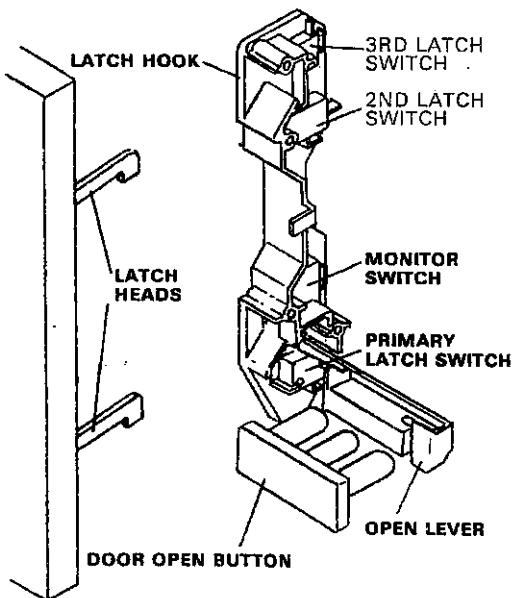


Figure D-1. Door Open Mechanism

PRIMARY LATCH SWITCH SW1

2ND LATCH SWITCH SW2

3RD LATCH SWITCH SW3

1. When the oven door is closed, the contacts (COM-NO) must be closed.
2. When the oven door is opened, the contacts (COM-NO) must be opened.

MONITOR SWITCH SW4

1. When the oven door is closed, the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NC) must be closed.
3. If the oven door is opened and the contacts (COM-NO) of the primary latch switch SW1 fail to open, the fuse F1 F8A blows simultaneously with closing the contacts (COM- NC) of the monitor switch SW4.

CAUTION: BEFORE REPLACING A BLOWN FUSE F1 F8A TEST THE PRIMARY LATCH SWITCH SW1, MONITOR SWITCH SW4 AND MONITOR RESISTOR R1 FOR PROPER OPERATION.(REFER TO CHAPTER "TEST PROCEDURE".)

MICRO. SELECT SWITCH SW5

1. When the cooking mode selector is set to "MICROWAVE", the contacts (COM-NC) must be closed.

2. When the cooking mode selector is set to "GRILL", the contacts (COM-NC) must be opened.
3. When the cooking mode selector is set to "DUAL", the contacts (COM-NC) must be closed.

GRILL. SELECT SWITCH SW6

1. When the cooking mode selector is set to "MICROWAVE", the contacts (COM-NC) must be opened.
2. When the cooking mode selector is set to "GRILL", the contacts (COM-NC) must be closed.
3. When the cooking mode selector is set to "DUAL", the contacts (COM-NC) must be opened.

MONITOR RESISTOR R1 3Ω 30W

The monitor resistor prevents the fuse F1 F8A from bursting when the fuse F1 F8A blows due to the operation of the monitor switch.

TIMER MOTOR (WITH VARI-SWITCH) TM

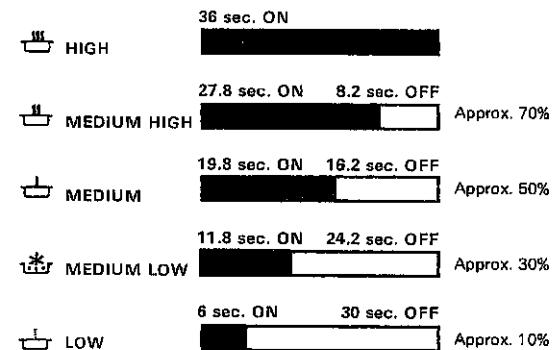
Timer contacts

1. When the timer is at "●" position, the contacts of the timer TM are opened.
2. When the timer is turned clockwise from "●" position, the contacts of the timer TM are closed.

Vari-contacts (COM - NO):

The vari-contacts are operated by the cam roller. If the variable cooking control is set at MEDIUM HIGH, MEDIUM, MEDIUM LOW or LOW cooking position, the line voltage is supplied to the power transformer intermittently within a 36 seconds time base. The following chart shows the vari-contacts (COM - NO) operation in the various modes.

SETTING



Note: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

FUSE F1 F8A 250V

1. The fuse also blows when primary latch switch SW1 remains closed with the oven door open and when the monitor switch SW4 closes.
2. The fuse blows when the asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of power transformer is shorted.

FUSE F2

If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.

THERMAL CUT-OUT 125°C TC1 (MG)

The thermal cut-out protects the magnetron against overheat. If this temperature goes up higher than 125°C because the fan motor is interrupted, the ventilation openings are blocked, the thermal cut-out TC1 will open and line voltages to the power transformer T will be cut off and the operation of the magnetron MG will be stopped. The defective thermal cut-out TC1 must be replaced with new one.

THERMAL CUT-OUT 125°C TC2 (OVEN)

The thermal cut-out located on the top of the oven cavity is designed to prevent damage to the oven if the foods in the oven catch fire due to over heating produced by unproper setting of cook time or failure of control unit. Under normal operation, the oven thermal cut-out remains closed. However, when abnormally high temperatures are reached within the oven cavity, the oven thermal cut-out will open at 125°C, causing the oven to shut down. The defective thermal cut-out TC2 must be replaced with new one.

TURNTABLE MOTOR

The turntable motor drives the turntable roller assembly to rotate the turntable.

FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity

NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power circuit.

SURGE RELAY RY AND SURGE RESISTOR R2 10Ω / 20W

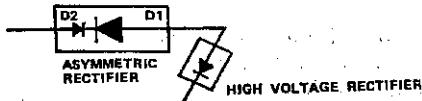
- When the oven is switched on the surge current (peak current) flows through the surge resistor R2

for approx. 6msec. The surge resistor R2 puts down the surge current (peak current).

- After approx. 6msec. the contacts of the surge relay RY close and the line voltage is supplied to the power transformer T.
- If the surge resistor R2 is defective, the home fuse or fuse F2 may break down when the oven is switched on.
- If the contacts of the surge relay RY remains opened after 6msec. since the oven is switched on, the temperature of the surge resistor R2 of may rise high and may damage the electric or mechanical parts around the surge resistor R2.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the power transformer by blowing the fuse F8A F1 when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage.

(The process of blowing the fuse F1)

- The high voltage rectifier is shorted by any causes when microwave cooking.
- The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
- D2 of the rectifier is shorted.
- The large electric currents flow through the high voltage winding of the power transformer.
- The large electric currents beyond F8A flow through the primary winding of the power transformer.
- The fuse F1 blows by the large electric currents.
- The power supply to the power transformer is cut off.

GRILL HEATING ELEMENTS GH

The grill heating elements are provided to brown the food and is located on the top of the oven cavity.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts:

High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test carried out.

REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable and close the door. Set the power level to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F (F8A) in the primary latch switch - monitor switch - monitor resistor circuit, check the primary latch switch, monitor switch and monitor resistor before replacing the fuse F1(F8A).

TEST PROCEDURE		A MAGNETRON	B POWER TRANSFORMER	C RECTIFIER ASSEMBLY	D H.V. CAPACITOR	E PRIMARY LATCH SWITCH	E 2ND LATCH SWITCH	E 3RD LATCH SWITCH	E MONITOR SWITCH	F MICRO SELECT SWITCH	G THERMAL CUT-OUT PROTECTOR	H GRILL SELECT SWITCH	I TIMER CONTACT	J FUSE 15A	K FUSE 8A	L SURGE RELAY	M NOISE FILTER	N SURGE RESISTOR	M FAN MOTOR	M TURNTABLE MOTOR	N GRILL HEATING ELEMENTS	N OVEN LAMP OR SOCKET	M POWER SUPPLY CORD	L WALL OUTLET
CONDITION	PROBLEM																							
OFF CONDITION	Fuse F2 15A browns when power cord is plugged into wall outlet.															O	O							
	Fuse F1 F8A browns when door is opened.						O									O	O							O
	Oven lamp does not light when door is opened.					O						O			O	O					O	O	O	O
	Home fuse browns when power cord is plugged into wall outlet																				O	O		
ON CONDITION COMMON	Oven does not operate at all.													O	O	O					O	O	O	O
	Oven goes into cook cycle but shuts down before end of cooking.												O	O							O		O	O
	Oven lamp does not light. (Fan motor rotates.)																				O	O		
	Fan motor does not operate, but oven lamp lights.																		O			O		O
	Timer motor does not operate, but oven lamp lights.												O									O		O
	Turntable motor does not operate, but oven lamp lights.																			O			O	
	Oven lamp lights but fan motor, turntable motor and timer motor do not operate.					O	O																	O
MICROWAVE COOKING CONDITION	Oven seems to be operating but little or no heat is produced in oven load. (Variable cooking control is set at "HIGH" position.)	O	O	O	O		O	O						O	O	O							O	O
	Oven does not operate properly in any other position except "HIGH" position.															O								
	Oven goes into cook cycle, but shuts down before end of cycle.											O								O			O	
	Home fuse or breaker browns when the oven is started.																		O	O				
GRILL COOKING CONDITION	Grill heating elements do not heat. (Oven lamp lights, fan motor and turntable motor operate.)											O								O	O		O	O
	Oven stops its operation after a while.											O							O			O		
DUAL COOKING CONDITION	Grill heating elements do not heat. (The oven seems to be operating)											O								O	O		O	O
	Little or no heat is produced in oven load. (The oven seems to be operating.)	O	O	O	O		O	O				O			O	O							O	O

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	<p>MAGNETRON TEST</p> <p>NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.</p> <p>CARRY OUT <u>3D</u> CHECKS</p> <p>Isolate the magnetron from the high voltage circuit by removing all leads connected to the filament terminal.</p> <p>To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.</p> <p>To test for a short circuit filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.</p> <p>MICROWAVE OUTPUT POWER (IEC-705-1988)</p> <p>The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT ($^{\circ}$C) during this microwave heating period, the calorie of the water is $V \times \Delta T$.</p> <p>The formula is as follows; $P \times t / 4.187 = V \times \Delta T \quad P (W) = 4.187 \times V \times \Delta T / t$</p> <p>Our condition for the water load is as follows: Room temperature around 20°C Power supply Voltage Rated voltage Water load 1000 g Initial temperature $10 \pm 2^{\circ}$C Heating time 47 sec. $P = 90 \times \Delta T$</p>

Measuring condition:

1. Container

The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.

2. Temperature of the oven and vessel

The oven and the empty vessel are at ambient temperature prior to the start of the test.

3. Temperature of the water

The initial temperature of the water is $(10 \pm 2)^{\circ}$ C.

4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.

5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.

6. The graduation of the thermometer must be scaled by 0.1° C at minimum and an accurate thermometer.

7. The water load must be (1000 ± 5) g.

8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
(Example: The initial temperature $T_1 = 11^{\circ}$ C)

2. Add the 1 litre water to the vessel.

3. Place the load on the centre of the shelf.

4. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 ± 2) K.

5. Stir the water to equalize temperature throughout the vessel.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

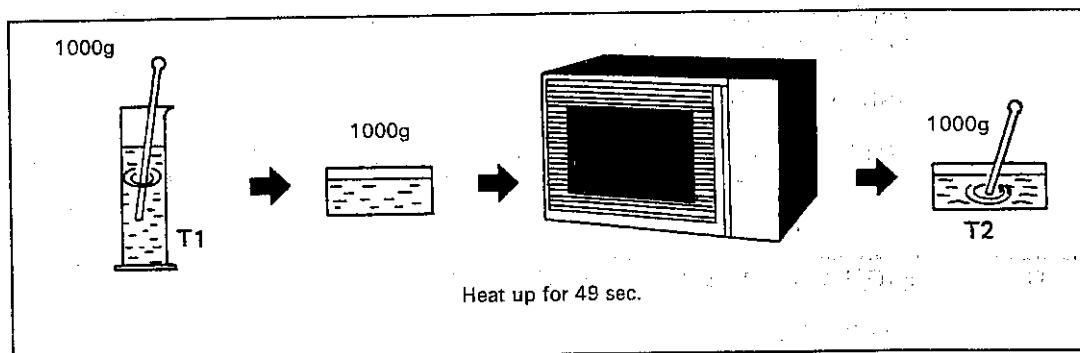
COMPONENT TEST

6. Measure the final water temperature. (Example: The final temperature $T_2 = 21^\circ\text{C}$)
 7. Calculate the microwave power output P in watts from above formula.

Initial temperature	$T_1 = 11^\circ\text{C}$
Temperature after $(47 + 2) = 49$ sec.	$T_2 = 21^\circ\text{C}$
Temperature difference Cold-Warm	$\Delta T_1 = 10^\circ\text{C}$
Measured output power	
The equation is " $P = 90 \times \Delta T$ "	$P = 90 \times 10^\circ\text{C} = 900$ Watts

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 90 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B POWER TRANSFORMER TEST

WARNING: High voltages and large currents are present at the secondary winding and filament winding of the power transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the power transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained :-

- a. Primary winding ----- 1.3 ohms approximately
- b. Secondary winding ----- 82 ohms approximately
- c. Filament winding ----- less than 1 ohm

If the reading obtained are not as stated above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TESTCARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

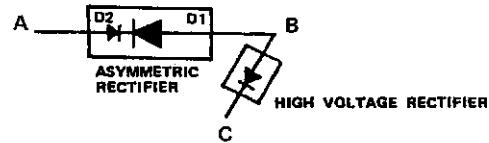
this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both directions then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the the asymmetric rectifier is probably faulty and must be replaced with the high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power transformer is shorted.



CARRY OUT 4R CHECKS

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10 MΩ after it has been charged.
- D. A short-circuited capacitor shows continuity all the time.
- E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10 MΩ resistance.
- F. When the internal wire is opened in the high voltage capacitor, the capacitor shows an infinite resistance.
- G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect readings are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS

E SWITCH TEST

CARRY OUT 3D CHECKS.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	Open circuit	Short circuit
Depressed	Short circuit	Open circuit

COM; Common terminal

NO; Normally open terminal

NC; Normally close terminal

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST																
F	<p>THERMAL CUT OUT TEST</p> <p>CARRY OUT 3D CHECKS</p> <p>Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.</p> <p>CARRY OUT 4R CHECKS</p> <p style="text-align: center;">Table: Thermal Cut-out Test</p> <table border="1"> <thead> <tr> <th>PARTS NAME Condition</th><th>THERMAL CUT-OUT 125°C (MAG)</th><th>THERMAL CUT-OUT 150°C (GRILL)</th><th>THERMAL CUT-OUT 160°C (OVEN)</th></tr> </thead> <tbody> <tr> <td>Temperature of "ON" condition (closed circuit).</td><td>This is not resetable type</td><td>This is not resetable type</td><td>This is not resetable type</td></tr> <tr> <td>Temperature of "OFF" condition (open circuit).</td><td>Above 125°C</td><td>Above 150°C</td><td>Above 160°C</td></tr> <tr> <td>Indication of ohmmeter (When room temperature is approx. 20°C.)</td><td>Closed circuit</td><td>Closed circuit</td><td>Closed circuit</td></tr> </tbody> </table> <p>If incorrect readings are obtained, replace the thermal cut-out.</p> <p>An open circuit thermal cut-out (MG) indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.</p> <p>An open circuit thermal cut-out (OVEN) indicates that the foods in the oven may catch fire, this may be due to over heating produced by unproper setting of the cooking timer or failure of the control panel.</p> <p>An open circuit thermal cut-out (GRILL) indicates that the oven cavity has overheated, this may be due to no load operation.</p>	PARTS NAME Condition	THERMAL CUT-OUT 125°C (MAG)	THERMAL CUT-OUT 150°C (GRILL)	THERMAL CUT-OUT 160°C (OVEN)	Temperature of "ON" condition (closed circuit).	This is not resetable type	This is not resetable type	This is not resetable type	Temperature of "OFF" condition (open circuit).	Above 125°C	Above 150°C	Above 160°C	Indication of ohmmeter (When room temperature is approx. 20°C.)	Closed circuit	Closed circuit	Closed circuit
PARTS NAME Condition	THERMAL CUT-OUT 125°C (MAG)	THERMAL CUT-OUT 150°C (GRILL)	THERMAL CUT-OUT 160°C (OVEN)														
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Temperature of "OFF" condition (open circuit).	Above 125°C	Above 150°C	Above 160°C														
Indication of ohmmeter (When room temperature is approx. 20°C.)	Closed circuit	Closed circuit	Closed circuit														

G **TIMER MOTOR (WITH VARI-SWITCH) TEST**

CARRY OUT 3D CHECKS before any of the following timer tests.

TIMER - CONTACTS

Disconnect the leads from terminals described at following table. Connect an ohmmeter across terminals described at following table. Advance the timer and check that a short circuit reading is obtained on the meter. Turn the timer back to the zero (0) position and check that an open circuit reading is obtained on the meter. If these readings are not obtained then replace the timer.

Disconnecting and checking terminals	1 and 2
--------------------------------------	---------

TIMER - MOTOR

Disconnect the leads from terminals described at following table. Connect an ohmmeter across the timer motor winding, terminals are described at following table, and check that a reading of resistance described at following table is indicated. If this reading is not obtained then the timer is probably defective and should be replaced. (Also refer to test procedure N.)

Disconnecting and checking terminals	5 and 6
Resistance of motor winding	approximately 34.2 kohms

CARRY OUT 4R CHECKS after any of the above tests.

VARI SWITCH - CONTACTS

Before proceeding with this part of the test, check the relay coil as outlined above.

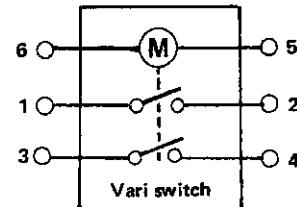
WARNING: This test requires the oven to be operated with supply connected. Follow the instruction below carefully.

1. **CARRY OUT 3D CHECKS**

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
	<ol style="list-style-type: none">2. Disconnect the leads to the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis.3. Disconnect the leads from terminals 3 and 4 of the timer, make sure that these leads remain isolated from other components and the oven chassis (use insulation tape if necessary). Do not disconnect leads from terminals 5 and 6.4. Securely clip the leads of an ohmmeter across terminals 3 and 4 of the timer. (Make sure the meter can be read easily without being touched during the test.)5. Close the door of the oven.6. Connect the supply.7. Set the TIMER to several minutes.8. Without touching the meter or any part of the oven make a note of the time which the ohmmeter indicates Short and Open circuit in each power level as described in the table.9. Set the MICROWAVE TIMER to 0 (zero).10. CARRY OUT 3D CHECKS<ol style="list-style-type: none">11. Disconnect ohmmeter lead from terminal 4 of the timer.12. Reconnect the lead of the panel harness to the terminal 4 of the timer.13. Disconnect the lead from contact <u>NC</u> of vari switch.14. Clip the lead of an ohmmeter to contact <u>NC</u> of vari switch.15. Repeat steps 5, 6, 7, 8, 9 and 10. But in this time, the ohmmeter must indicate Short and Open circuit reversely against the table.16. Disconnect ohmmeter leads from terminals 3 of the timer and contacts <u>NC</u> of vari switch.17. Reconnect the leads to the primary of the power transformer.

VARI-MODE	ON TIME	OFF TIME
HIGH (approx. 100% power)	36 sec.	0 sec.
MEDIUM HIGH (approx. 70% power)	27.8 sec.	8.2 sec.
MEDIUM (approx. 50% power)	19.8 sec.	16.2 sec.
MEDIUM LOW (approx. 30% power)	11.8 sec.	24.2 sec.
LOW (approx. 10% power)	6 sec.	30 sec.



Timer motor with vari switch

ON: Meter indicates closed. OFF: Meter indicates open.

Check results: If any of the condition as described in the table are not obtained at step 8, or the ohmmeter does not indicate reverse conditions against the table, then the timer should be replaced.

CARRY OUT 4R CHECKS

H BLOWN FUSE F2

CARRY OUT 3D CHECKS

If the fuse F2 is blown, there could be shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

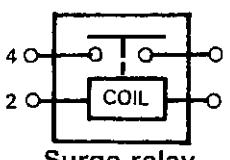
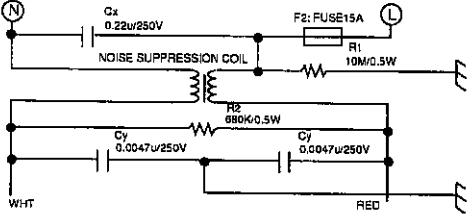
CARRY OUT 4R CHECKS

CAUTION: Only replace fuse F2 with the correct value replacement

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
I	<u>BLOWN FUSE F1 F8A</u>
	CARRY OUT <u>3D</u> CHECKS
	<ol style="list-style-type: none">1. If the fuse <u>F1</u> F8A is blown when the door is opened, check the primary latch switch, monitor switch and monitor resistor. If the fuse <u>F1</u> F8A is blown by incorrect door switching replace the defective switch(s) and the fuse <u>F1</u> F8A.2. If the fuse <u>F1</u> is blown, there could be a short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may have occurred due to short or ground in H.V. rectifier, magnetron, power transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.
	CARRY OUT <u>4R</u> CHECKS
	CAUTION: Only replace fuse with the correct value replacement.
J	<u>SURGE RELAY TEST</u>
	CARRY OUT <u>3D</u> CHECKS
	Disconnect the leads to terminals 1 and 2. Connect an ohmmeter across the terminals 1 and 2, a reading of approximately 15 kohms should be indicated. If this is not the case then the relay coil is probably faulty and the relay should be replaced.
	CARRY OUT <u>4R</u> CHECKS
	<u>Relay contact test for open circuit:</u>
	Before proceeding with this part of the test, check the relay coil as outlined above.
	WARNING: This test requires the oven to be operated with supply connected. Follow the instruction below carefully.
	<ol style="list-style-type: none">1. CARRY OUT <u>3D</u> CHECKS2. Disconnect the leads to the primary of the power transformer.3. Disconnect the leads from terminals 4 and 5 of the surge relay, make sure that these leads remain isolated from other components and the oven chassis (use insulation tape if necessary). Do not disconnect leads from terminal 1 and 2.4. Securely clip the leads of an ohmmeter across terminals 4 and 5 of the surge relay. (Make sure the meter can be read easily without being touched during test)5. Close the door of the oven.6. Connect the supply.7. Set the MICROWAVE TIMER to 1 minute.8. Without touching the meter or any part of the oven make a note of the reading indicated.9. Set the MICROWAVE TIMER to 0 (zero).10. CARRY OUT <u>3D</u> CHECKS11. Disconnect the meter from terminals 4 and 5 of the surge relay.12. CARRY OUT <u>3D</u> CHECKS13. Disconnect the meter leads and reconnect the leads to the primary of the power transformer.
	Check results: The meter reading should show continuity (short circuit), if the reading shows open circuit then the relay contacts are probably faulty and the relay should be replaced.
	CARRY OUT <u>4R</u> CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST																
<u>Relay contact test for short circuit:</u>																	
<u>CARRY OUT 3D CHECKS</u>																	
<p>Isolate terminals 1 and 2, 4 and 5 of the surge relay. Using an ohmmeter, check continuity between terminal 4 and 5. A reading of infinite resistance should be obtained. If this is not the case then the relay is probably faulty and should be replaced.</p>																	
<u>CARRY OUT 4R CHECKS</u>																	
																	
K	<u>NOISE FILTER TEST</u>																
<u>CARRY OUT 3D CHECKS</u>																	
<p>Disconnect the leads from the terminals of the noise filter.</p>																	
<p>Using an ohmmeter, check between the terminals as described in the following table.</p>																	
																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">L(min)</th> <th style="text-align: center;">$Cx \pm 20\%$</th> <th style="text-align: center;">$Cy \pm 20\%$</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.0mH</td> <td style="text-align: center;">$0.22\mu F$</td> <td style="text-align: center;">$0.0047\mu F$</td> </tr> </tbody> </table>		L(min)	$Cx \pm 20\%$	$Cy \pm 20\%$	1.0mH	$0.22\mu F$	$0.0047\mu F$										
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MEASURING POINTS		INDICATION OF OHMMETER															
Between N and L		Approx. $680\text{ k}\Omega$															
Between terminal N and WHITE		Short circuit															
Between terminal L and RED		Short circuit															
<p>If incorrect readings are obtained, replace the noise filter unit.</p>																	
<u>CARRY OUT 4R CHECKS</u>																	
L	<u>MONITOR RESISTOR AND SURGE RESISTOR TEST</u>																
<u>CARRY OUT 3D CHECKS.</u>																	
<p>Disconnect the leads from the monitor resistor or surge resistor.</p>																	
<p>Using an ohmmeter and set on a low range.</p>																	
<p>Check between the terminals of the monitor resistor or surge resistor as described in the following table.</p>																	
<p style="text-align: center;">Table: Resistance</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Resistor</th> <th style="text-align: center;">Resistance</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Monitor resistor</td> <td style="text-align: center;">Approx. 3Ω</td> </tr> <tr> <td style="text-align: center;">Surge resistor</td> <td style="text-align: center;">Approx. 10Ω</td> </tr> </tbody> </table>		Resistor	Resistance	Monitor resistor	Approx. 3Ω	Surge resistor	Approx. 10Ω										
Resistor	Resistance																
Monitor resistor	Approx. 3Ω																
Surge resistor	Approx. 10Ω																
<p>If incorrect readings are obtained, replace the monitor resistor or surge resistor</p>																	
<u>CARRY OUT 4R CHECKS.</u>																	

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST						
M	<u>MOTOR WINDING TEST</u>						
	CARRY OUT <u>3D</u> CHECKS						
	Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.						
	Table: Resistance of Motor						
	<table border="1"><thead><tr><th>Motors</th><th>Resistance</th></tr></thead><tbody><tr><td>Fan motor</td><td>Approximately 176Ω</td></tr><tr><td>Turntable motor</td><td>Approximately 15.5kΩ</td></tr></tbody></table>	Motors	Resistance	Fan motor	Approximately 176Ω	Turntable motor	Approximately 15.5kΩ
Motors	Resistance						
Fan motor	Approximately 176Ω						
Turntable motor	Approximately 15.5kΩ						
	If incorrect readings are obtained, replace the motor.						
	CARRY OUT <u>4R</u> CHECKS						
N	<u>GRILL HEATING ELEMENT TEST</u>						
	CARRY OUT <u>3D</u> CHECKS						
	Before carrying out the following tests make sure the heating element is cool completely.						
	1. <u>Resistance of heating element</u>						
	Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table.						
	Table: Resistance of heating element						
	<table border="1"><thead><tr><th>Parts name</th><th>Resistance</th></tr></thead><tbody><tr><td>Grill heating element</td><td>Approximately $25.6\Omega \times 2 = 51.2\Omega$</td></tr></tbody></table>	Parts name	Resistance	Grill heating element	Approximately $25.6\Omega \times 2 = 51.2\Omega$		
Parts name	Resistance						
Grill heating element	Approximately $25.6\Omega \times 2 = 51.2\Omega$						
	2. <u>Insulation resistance</u>						
	Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100MΩ insulation tester. The insulation resistance should be more than 10MΩ in the cold start.						
	If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.						
	CARRY OUT <u>4R</u> CHECKS						

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch heads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.

6. Discharge the H.V. capacitor before carrying out any further work.

7. Do not operate the oven with the outer case removed.

N.B.; Step 1,2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS
2. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.
3. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder.
4. Remove one (1) screw holding capacitor holder to the oven cavity.
5. Release the capacitor holder from the duct.

6. Remove the capacitor from the capacitor holder.
7. Now high voltage rectifier assembly and capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

POWER TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the filament leads of the power transformer from high voltage capacitor and the magnetron.
3. Disconnect the H.V. wire A from the power transformer.

4. Disconnect the main wire harness from the power transformer.
5. Remove the two (2) screws and one (1) washer holding the transformer to base plate.
6. Remove the transformer.
7. Now, the power transformer is free.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove the air separate duct from the chassis support and the air intake duct.
3. Disconnect the H.V. wire and filament lead of the transformer from the magnetron.

4. Remove the one (1) screw holding the chassis support to the magnetron.
5. Move the air intake duct to left.
6. Remove the air deflector from the magnetron.

7. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.
8. Remove the magnetron from the waveguide with care so that the magnetron antenna is not hit by any metal object around the antenna

9. Remove the magnetron cushion from the magnetron.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tabs of the fan duct.
4. Disconnect the wire leads from the fan motor.
5. Remove the one (1) screw holding the capacitor holder to the oven cavity back plate.
6. Remove the one (1) screw holding the fan duct to the oven cavity back plate.

7. Release the tabs of the capacitor holder from the fan duct.
8. Remove the fan duct from the oven.
9. Remove the fan blade assembly from the fan motor.
10. Remove the two (2) screws and two (2) nuts holding the fan motor to the fan duct.
11. Now, the fan motor is free.

CONTROL PANEL REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the main harness from the timer motor, grill select switch and micro select switch.

3. Remove the two (2) screws holding the control panel to the oven cavity.
4. Lift up the control panel assembly and pull it forward. Now, the control panel assembly is free.

TURNTABLE MOTOR REMOVAL

1. Disconnect the oven from power supply.
2. Remove the turntable motor cover by removing the single (1) screw.

3. Disconnect the wire lead from turntable motor and remove the two(2) screws holding the turntable motor.
4. Turntable motor is now free.

TURNTABLE COUPLING REMOVAL

1. Remove the turntable motor, refer to "Turntable Motor Removal".
2. Remove the two (2) screws holding the turntable motor support angle to the oven cavity.
3. Remove the turntable motor support angle from the oven cavity.
4. Pull the coupling out of the hole in the oven cavity.
5. At that time the turntable coupling will be free.

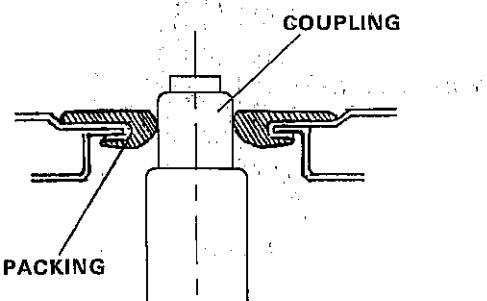


Figure C-1. Turntable Coupling

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
3. Lift up the oven lamp socket.
4. Now, the oven lamp socket is free.

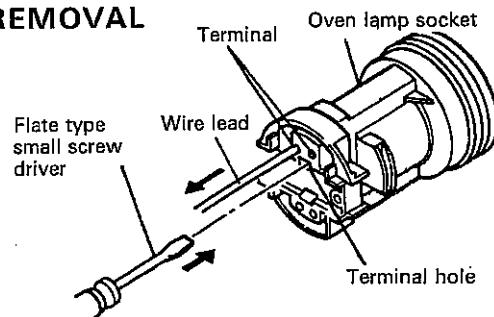


Figure C-2. Oven lamp socket

GRILL HEATING ELEMENTS REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the exhaust duct to the oven cavity.
3. Remove the exhaust duct from the oven cavity.
4. Disconnect the wire leads from the grill heating elements.
5. Lay down the two (2) tabs holding the heater reflector to the oven cavity.
6. Remove the heater reflector from the oven cavity by sliding it toward the magnetron.
7. Make the tabs of the grill heater angle straight.
8. Remove the grill heater angle, grill heating elements and the short terminal together from the heater reflector.
9. Remove the grill heater angle from the grill heating elements.
10. Remove the two (2) screws holding the short terminal to the grill heating elements.
11. Now the grill heating elements are free.

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the green/yellow wire to the chassis support.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-3 (a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

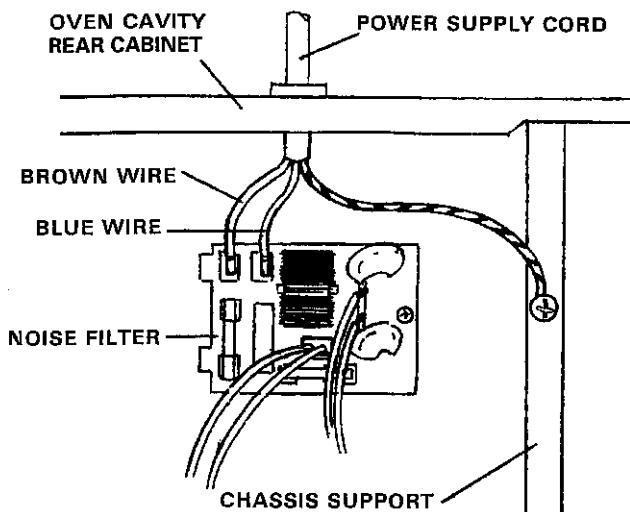


Figure C-3 (a) Replacement of Power Supply Cord

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-3 (b).
2. Install the earth wire lead of power supply cord and the earth angle to the chassis support with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

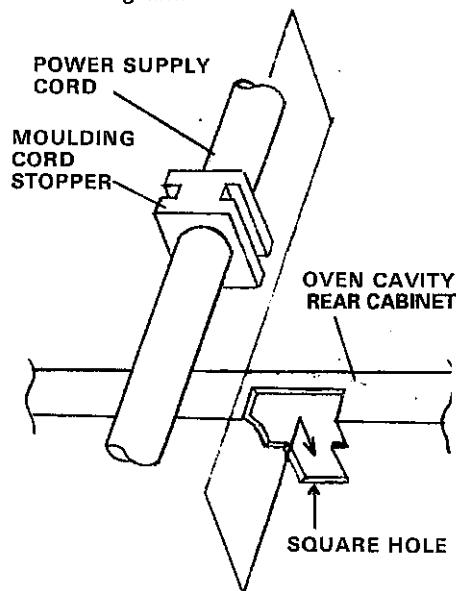


Figure C-3 (b) Replacement of Power Supply Cord

PRIMARY, 2ND., AND 3RD. LATCH SWITCH AND MONITOR SWITCHES REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Push the retaining tab slightly and remove the switch.

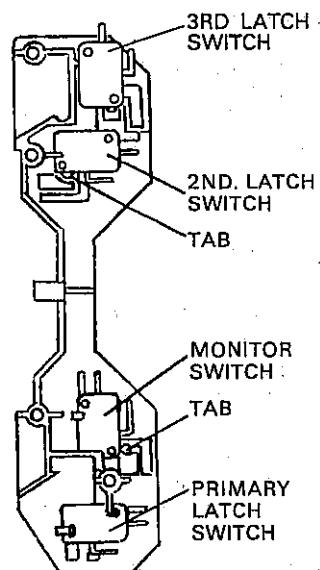


Figure C-4. Switches

PRIMARY, 2ND., AND 3RD. LATCH SWITCH AND MONITOR SWITCHES ADJUSTMENT

If the primary latch switch, 2nd. latch switch, 3rd. latch switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With door closed, adjust the latch hook by moving it back and forward, or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the monitor switch and the 3rd. latch switch activated with the door closed. The vertical position of the latch hook should be placed where the primary latch switch and 2nd latch switch have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure of the primary latch switch, 2nd latch switch, 3rd latch switch and monitor switch operation. If those switches have not activated with the door closed, two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling the door toward the oven face. The results (play of the door) should be less than 0.5mm.
2. The contacts (COM-NO) of primary latch switch and 2nd latch switch interrupt the circuit before the door can be opened.

3. The contacts (COM-NC) of the monitor switch close when the door is opened.
4. The contacts (COM-NO) of the 3rd. latch switch open when the door is opened.
5. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

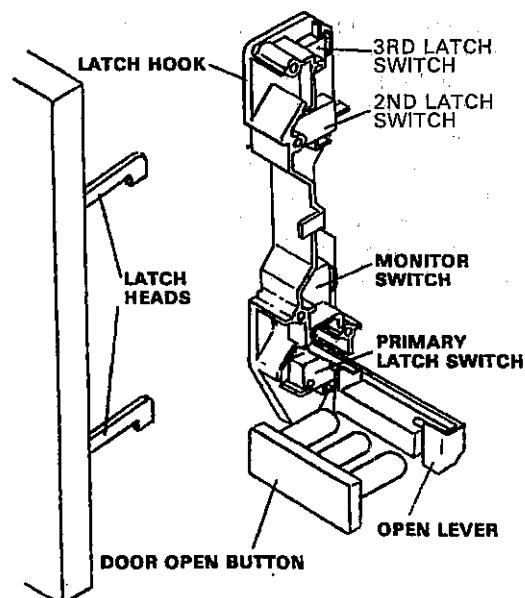


Figure C-5 Latch Switches Adjustment

DOOR FRAME AND SCREEN REMOVAL

Remove the door assembly, referring to from item 1 through item 4 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.
2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".
3. Remove the four (4) screws holding the door frame to the door panel assembly.

4. Release the door frame from the door panel assembly, now the door frame is free.
5. Remove the one (1) screw top of the frame inside.
6. Slide the door screen to the up side until stopped by door frame.
7. Lift up the door screen, now the door screen is free.

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. CARRY OUT 3D CHECKS

2. Remove five (5) screws holding the upper and lower oven hinge to the oven cavity. The lower oven hinge is now free.
3. Remove door assembly with upper oven hinge by pulling it forward.
4. Separate the door assembly and upper oven hinge. Door assembly is now free.
5. Re-install upper oven hinge to the new door assembly.
6. On re-installing new door assembly, secure the upper and lower oven hinges with the five (5) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.

7. CARRY OUT 4R CHECKS

Note: After any service to the door, the approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT

When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.

1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.

4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

LATCH HEAD REMOVAL

1. Remove the choke cover referring to the "CHOKE COVER REMOVAL".
2. Release the latch spring from the tabs of the door panel.
3. Release the latch spring from the latch head.
4. Release the latch head from the door panel.
5. Now, the latch head is free.

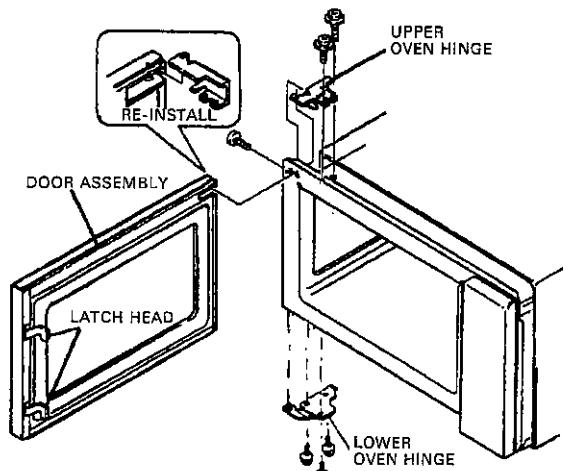


Figure C-6. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate(thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engagind part. The protect sheet may be used not to damage the door panel.
2. Lift up the choke cover, now choke cove is free.

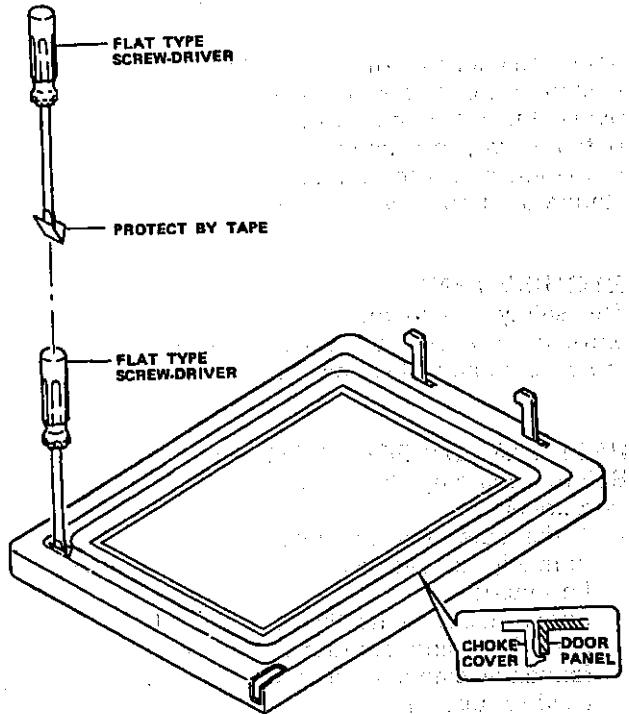


Figure C-7. Choke Cover Removal

DOOR FILM

Removal

1. Tear the door film from the door panel.
2. Now, the door film is free.

Installation

1. Put the adhesivetape on the backing film of the door film as shown in Fig. 8.
2. Tear the backing film by pullingthe adhesivetape.
3. Put the pasted side of the door film on the door panel.

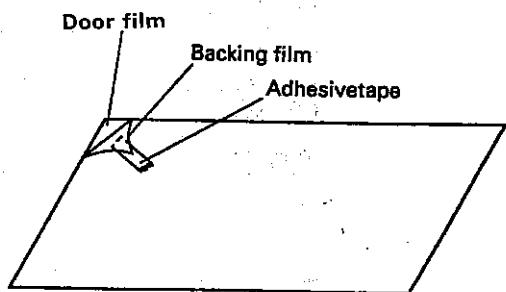


Figure C-8. Door film

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm^2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

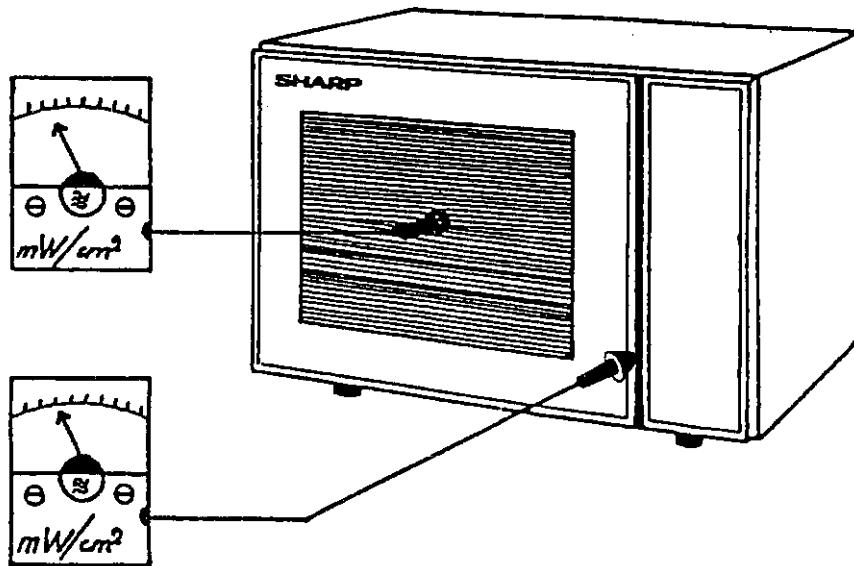
1. Make sure that the test instrument is operating normally as specified in its instruction booklet.

Important:

Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:
NARDA 8100
NARDA 8200
HOLADAY HI 1500
SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of $275 \pm 15\text{ml}$ of water initially at $20 \pm 5^\circ\text{C}$ in the center of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
4. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
5. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
6. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
7. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Fuse	F1	F8A / 250V
Fuse	F2	15A / 250V
Monitor resistor	R1	3Ω 20W
Surge resistor	R2	10Ω 20W
Thermal cut-out (MAGNETRIN)	TC1	125°C
Thermal cut-out (OVEN)	TC2	160°C
Thermal cut-out (GRILL)	TC3	150°C Cut off 130°C Return
Surge relay	RY	Approx. 15kΩ
Oven lamp	OL	200 - 250 V 25W E14
High voltage capacitor	C	1.13µF AC 2100V
Magnetron	MG	Filament < 1Ω Filament – chassis ∞ ohm.
Power transformer	T	Filament winding < 1Ω Secondary winding Approx. 82Ω Primary winding Approx. 1.3Ω

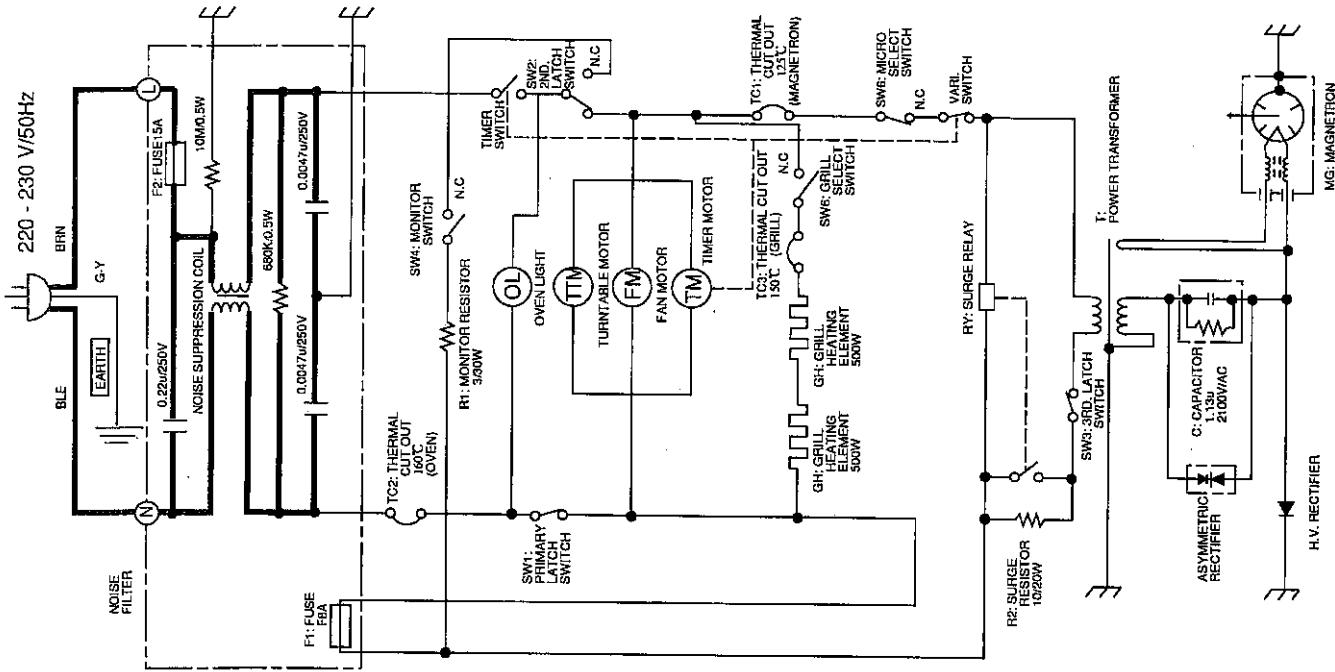
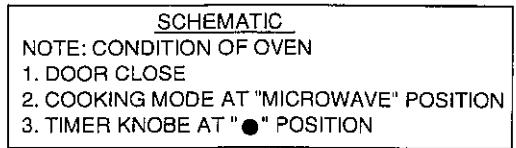


Figure O-1 Oven Schematic-Off Condition

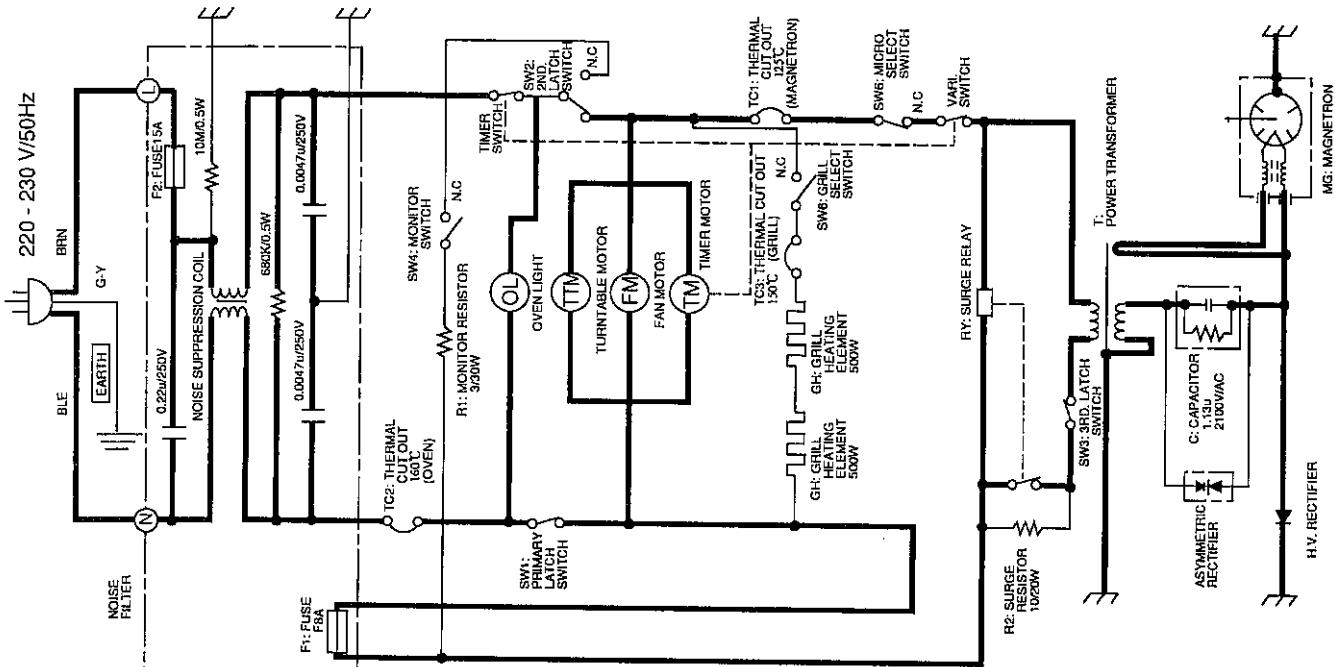
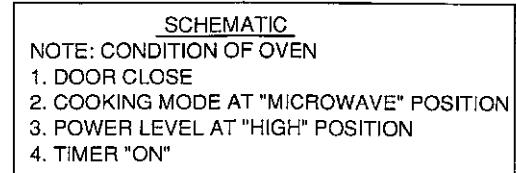


Figure O-2 Oven Schematic-Microwave Cooking Condition

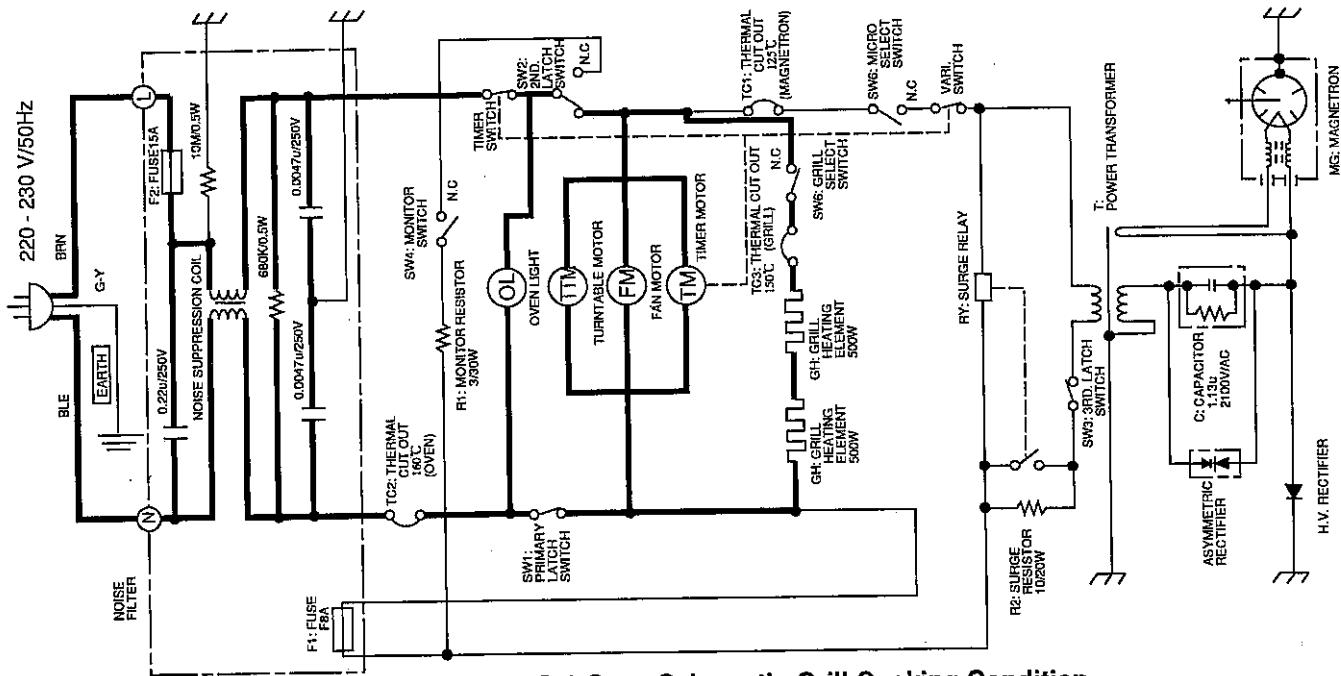
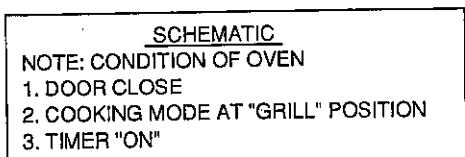


Figure O-3 Oven Schematic-Grill Cooking Condition

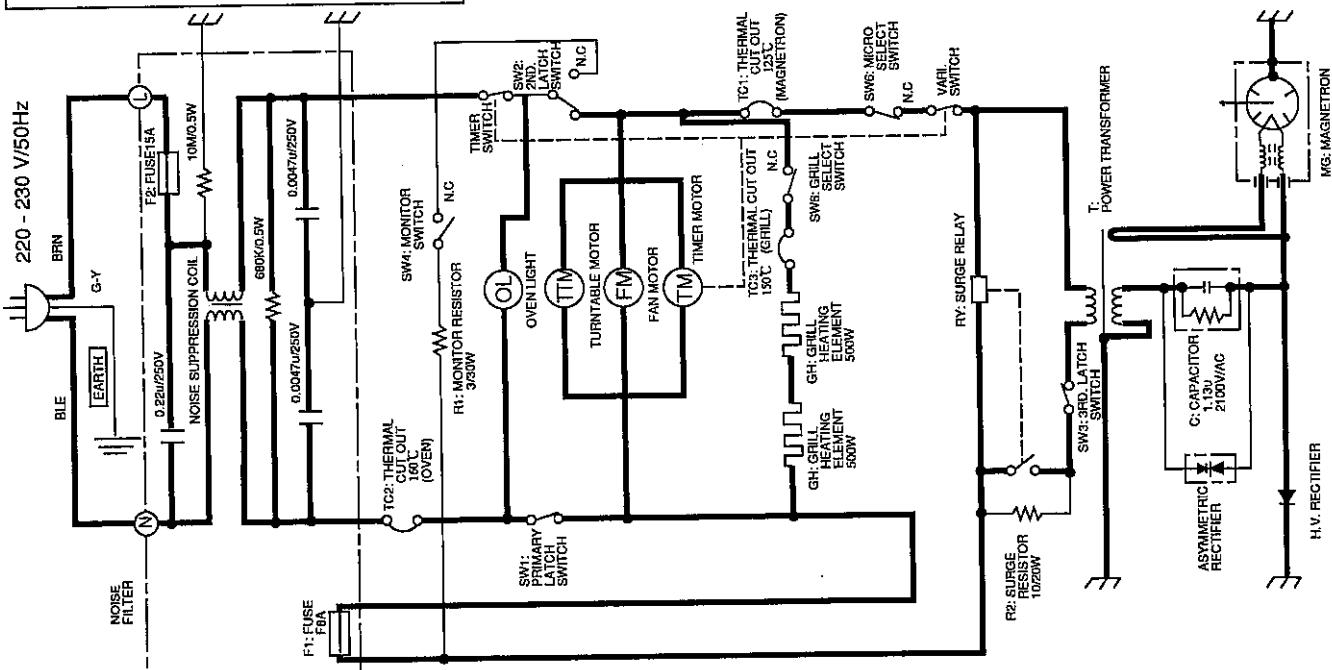
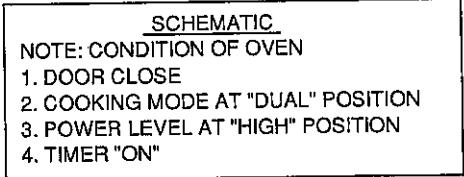


Figure O-4 Oven Schematic-Dual Cooking Condition

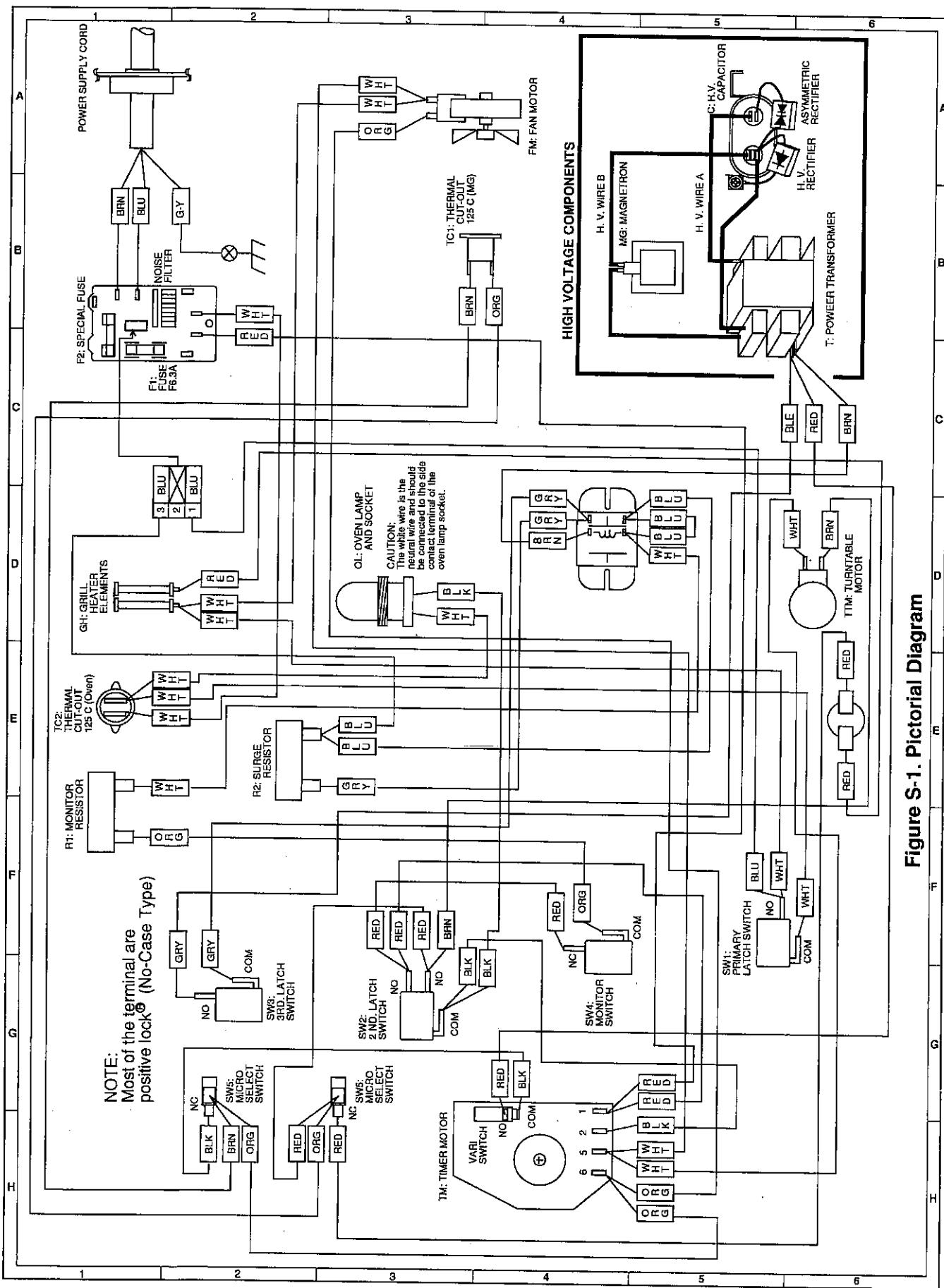


Figure S-1. Pictorial Diagram

PARTS LIST

Note: The parts marked "*" are used in voltage more than 250V.
"S"MARK: SPARE PARTS-DELIVERY SECTION

REF. NO.	PART NO.	S	DESCRIPTION	Q'TY	CODE
----------	----------	---	-------------	------	------

ELECTRIC PARTS

TM	OSWTEA098WR0	U	Timer motor	1	AZ
GH	FHET-A038WRK0	U	Grill heating assembly	1	BA
MG	RV-MZA177WR0	U	Magnetron	1	BG
C	RC-QZA142WR0	U	High volatage capacitor	1	AT
SW1	OSW-MA085WR0	J	Primary latch switch	1	AF
SW2	OSW-MA087WR0	J	2nd latch switch	1	AF
SW3	OSW-MA085WR0	J	3rd latch switch	1	AF
SW4	OSW-MA086WR0	J	Monitor switch	1	AF
FM	RMOTEA244WR0	U	Fan motor	1	AU
F1	OFS-CA014WR0	J	Fuse F8A	1	AC
F2	OFS-CA016WR0	J	Fuse 15A	1	AD
OL	RLMPTA057WR0	U	Oven lamp	1	AG
TTM	RMOTDA148WR0	J	Turntable motor	1	AP
R1	RR-WZA012WR0	J	Monitor resistor 4.3 ohm 20W	1	AL
R2	RR-WZA005WR0	J	Surge resistor 10 ohm 20W	1	AG
RY	RRLY-A035WR0	J	Surge relay	1	AS
TC1	RTHM-A078WR0	U	Thermal cut-out 125°C (Magnetron)	1	AL
TC2	RTHM-A078WR0	U	Thermal cut-out 125°C (Oven)	1	AL
TC3	RTHM-A082WR0	U	Thermal cut-out 150°C (Grill)	1	AL
T	RTRN-A353WR0	U	Power transformer	1	BN
1- 1	FH-DZA033WR0	J	H.V. rectifier assembly	1	AP
1- 2	FPWBFA233WR0	U	Noise filter	1	AV
1- 3	FACCVVA003WRK0	U	Power supply cord	1	AP
1- 4	OSOCCLA011WR0	J	Oven lamp socket	1	AH
1- 5	FSW-MA211WRK0	U	Select switch assembly	1	AX
1-5-1	OSW-MA086WR0	J	Grill select switch	1	AF
1-5-2	OSW-MA086WR0	J	Micro select switch	1	AF

CABINET PARTS

2- 1	GCABUA386WRP0	U	Outer case cabinet (B)	1	AX
2- 1	GCABUA383WRP0	U	Outer case cabinet (W)	1	AC
2- 2	MHNG-A296WRM0	U	Lower oven hinge	1	AE
2- 3	GCOVHA289WRP0	U	Turntable cover	1	AE
2- 4	GDAI-A219WRW0	U	Base plate	1	AS
2- 5	GLEGPA028WR0	U	Foot	4	AA
2- 6	FFTASA052WRK0	U	Oven lamp access cover (B)	1	AS
2- 6	FFTASA053WRK0	U	Oven lamp access cover (W)	1	AS
2-6-1	PCUSGA165WRP0	U	Oven lamp access cover cushion	1	AB

CONTROL PANEL PARTS

3- 1	HPNLCB057WR0	U	Control panel (B)	1	AQ
3- 1	HPNLCB056WR0	U	Control panel (W)	1	AQ
3- 2	JBTN-A826WRF0	U	Open button (B)	1	AD
3- 2	JBTN-A825WRF0	U	Open button (W)	1	AD
3- 3	JKNBKA468WR0	U	Vari knob (B)	1	AD
3- 3	JKNBKA466WR0	U	Vari knob (W)	1	AD
3- 4	JKNBKA469WR0	U	Timer knob (B)	1	AE
3- 4	JKNBKA467WR0	U	Timer knob (W)	1	AE
3- 5	MSPRCA045WR0	U	Open button spring	1	AA

OVEN PARTS

4- 1	DOVN-A347WRK0	U	Oven cavity	1	BQ
4- 2	LBNDKA089WRW0	U	Capacitor holder	1	AE
4- 3	PHOK-A078WRF1	U	Latch hook	1	AH
4- 4	FFANJA039WRK0	J	Fan blade assembly	1	AE
4- 5	PDUC-A503WRF0	U	Fan duct	1	AK

Note : The parts marked "*" are used in voltage more than 250V.
"S" MARK: SPARE PARTS-DELIVERY SECTION

REF. NO.	PART NO.	S	DESCRIPTION	Q'TY	CODE
4- 6	LANGFA155WRP1	U	Chassis support	1	AF
4- 7	PPACGA108WREO	U	Packing	1	AC
4- 8	LANGQA347WRPO	U	Lamp mounting angle	1	AE
4- 9	LANGQA350WRPO	U	TTM support angle	1	AC
4-10	MHNG-A295WRM0	U	Upper oven hinge	1	AD
4-11	MLEVFA074WRFO	U	Open lever	1	AD
4-12	NCPL-A043WRFO	U	Coupling	1	AE
4-13	PCOVPA263WREO	U	Waveguide cover	1	AD
4-14	PFILWA042WRPO	U	Lamp filter	1	AB
4-15	PDUC-A509WRFO	U	Air separate duct	1	AF
4-16	PDUC-A502WRF1	U	Air intake duct	1	AF
4-17	PCUSGA355WRPO	U	H.V. cushion	1	AA
4-19	PDUC-A514WRPO	U	Air duct	1	AH
4-20	PSPAJA001WRFO	U	Spacer	1	AA
4-21	PCUSUA346WRPO	U	Cushin	1	AA
4-22	LANGQA011WRM0	U	Earth angle	1	AA
4-23	QTANNA006WREO	J	Short terminal	1	AB
4-24	PCUSGA366WRPO	U	Top plate cushion	1	AA
4-25	FDUC-A244WRKO	U	Exhaust duct assembly	1	AT
4-26	PSKR-A265WRPO	U	Rear barrier	1	AH

DOOR PARTS

5	CDORFA570WRKO	U	Door assembly (B)	1	BN
5	CDORFA567WRKO	U	Door assembly (W)	1	BN
5- 1	FDORFA223WRTO	J	Door panel assembly	1	BF
5- 2	GCOVHA288WRFO	U	Choke cover	1	AL
5- 3	GWAKPA259WRFO	U	Door frame (B)	1	AS
5- 3	GWAKPA258WRFO	U	Door frame (W)	1	AS
5- 4	HPNL-A450WREO	U	Door screen (B)	1	AY
5- 4	HPNL-A449WREO	U	Door screen (W)	1	AY
5- 5	LSTPPA114WRFO	U	Latch head	1	AE
5- 6	MSPRTA141WREO	U	Latch spring	1	AA
5- 7	PSHEPA424WREO	U	Door film	1	AG
5- 8	XCPSD30P06000	J	Screw; 3mm x 6mm	1	AA
5- 9	XEBSD40P05000	J	Screw; 4mm x 5mm	1	AA

MISCELLANEOUS

6- 1	FROLPA063WRKO	U	Roller stay	1	BA
6- 2	NTNT-A007WREO	U	Turntable	1	AS
6- 3	TCADCA475WRRO	U	Cookbook	1	AW
6- 4	TINS-A340WRRO	U	Instruction book	1	AK
6- 5	QW-QZA175WREO	U	H.V. wire A	1	AE
6- 6	QW-QZA176WREO	U	H.V. wire B	1	AE
6- 7	FW-VZB179WRE1	U	Main wire harness	1	AY
6- 8	TCAUHA092WRRO	U	Caution label	1	AC
6- 9	TCAUHA093WRRO	U	Belgium label	1	AB
6-10	TSPCNB768WRRO	U	Rating label	1	AH
6-11	FAMI-A067WRKO	U	High rack	1	AY
6-12	FAMI-A068WRKO	U	Low rack	1	AX
6-13	TCADCA460WRRO	U	Grill leaf let	1	AW

SCREW, NUT AND WASHER

7- 1	XOTSD40P10000	J	Screw 4mm x 10mm	10	AA
7- 2	XHTSD40P08RV0	J	Screw 4mm x 8mm	4	AA
7- 3	XHSSF40P08000	J	Screw 4mm x 8mm (B)	1	AA
7- 3	XHSSC40P08000	J	Screw 4mm x 8mm (W)	1	AA
7- 4	XBSD40P22000	J	Screw 4mm x 22mm	2	AA
7- 5	XNED40-32000	J	Nut; 4mm x 3.2mm	2	AA
7- 6	LX-EZA045WREO	J	Special screw	6	AA
7- 7	LX-EZA046WREO	U	Special screw	7	AA
7- 8	LX-LZA011WREO	U	Rivet	2	AB
7- 8	XBUW30P06000	J	Screw 3mm x 6mm	2	AA
7- 9	XBUW40P06000	J	Screw 4mm x 6mm	1	AA
7-10	XCPSD30P06X00	J	Screw 3mm x 6mm	2	AA
7-11	XCPSD30P06000	J	Screw 3mm x 6mm	6	AA

Note : The parts marked "*" are used in voltage more than 250V.

"S" MARK: SPARE PARTS-DELIVERY SECTION

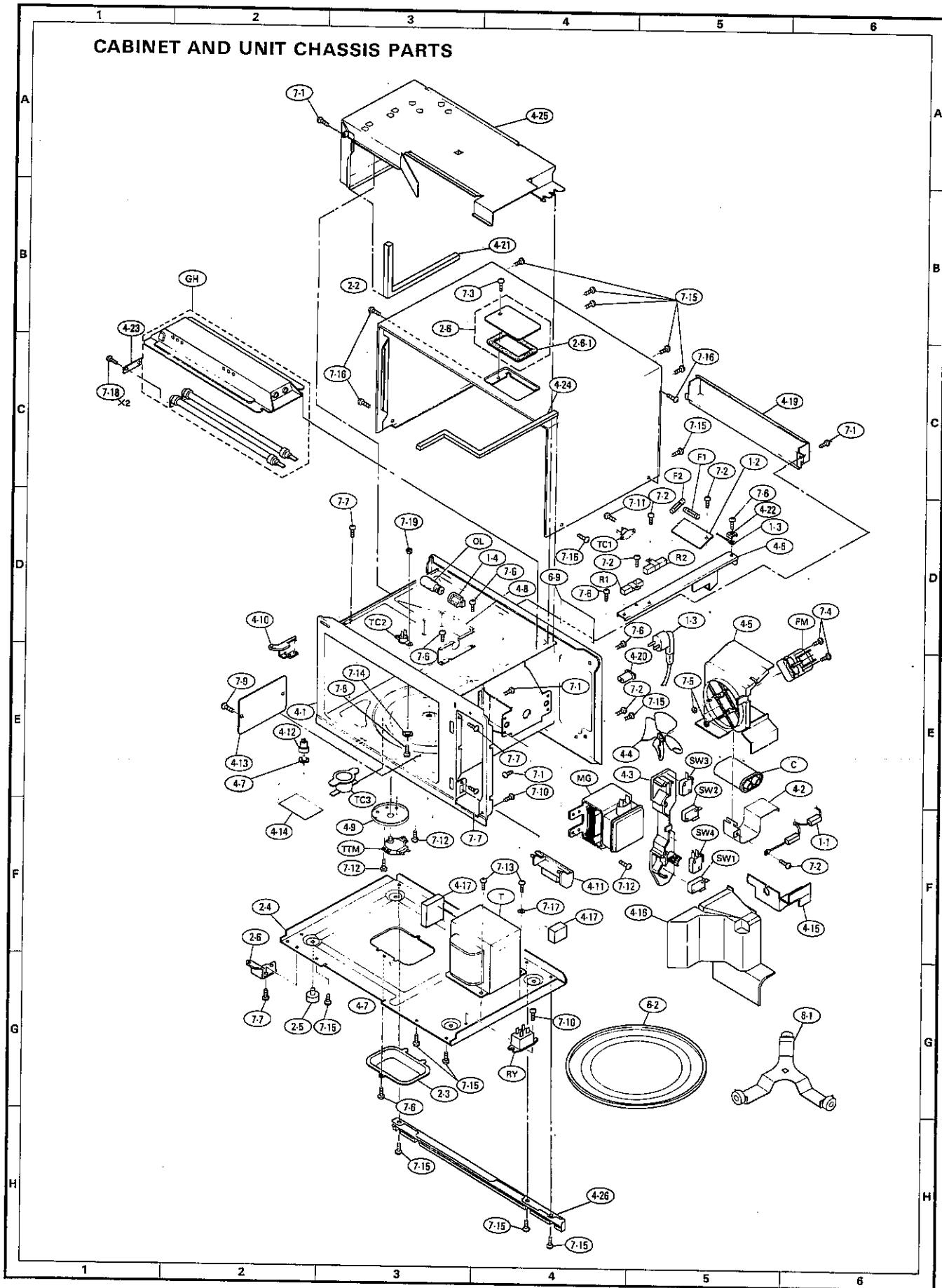
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7-14	PPACGA120WRE0	U	Washer	2	AA
7-15	XOTSD40P12RVO	J	Screw 4mm x 12mm	13	AA
7-16	XOTSD40P12000	J	Screw 4mm x 12mm (B)	4	AA
7-16	XOTSC40P12000	J	Screw 4mm x 12mm (W)	4	AA
7-17	XWWSD50-06000	J	Washer 4mm x 0.6mm	1	AA
7-18	XBPWW30P05K00	U	Screw 3mm x 5mm	2	AA
7-19	XNESD30-24000	J	Nut; 3mm x 2.4mm	2	AA

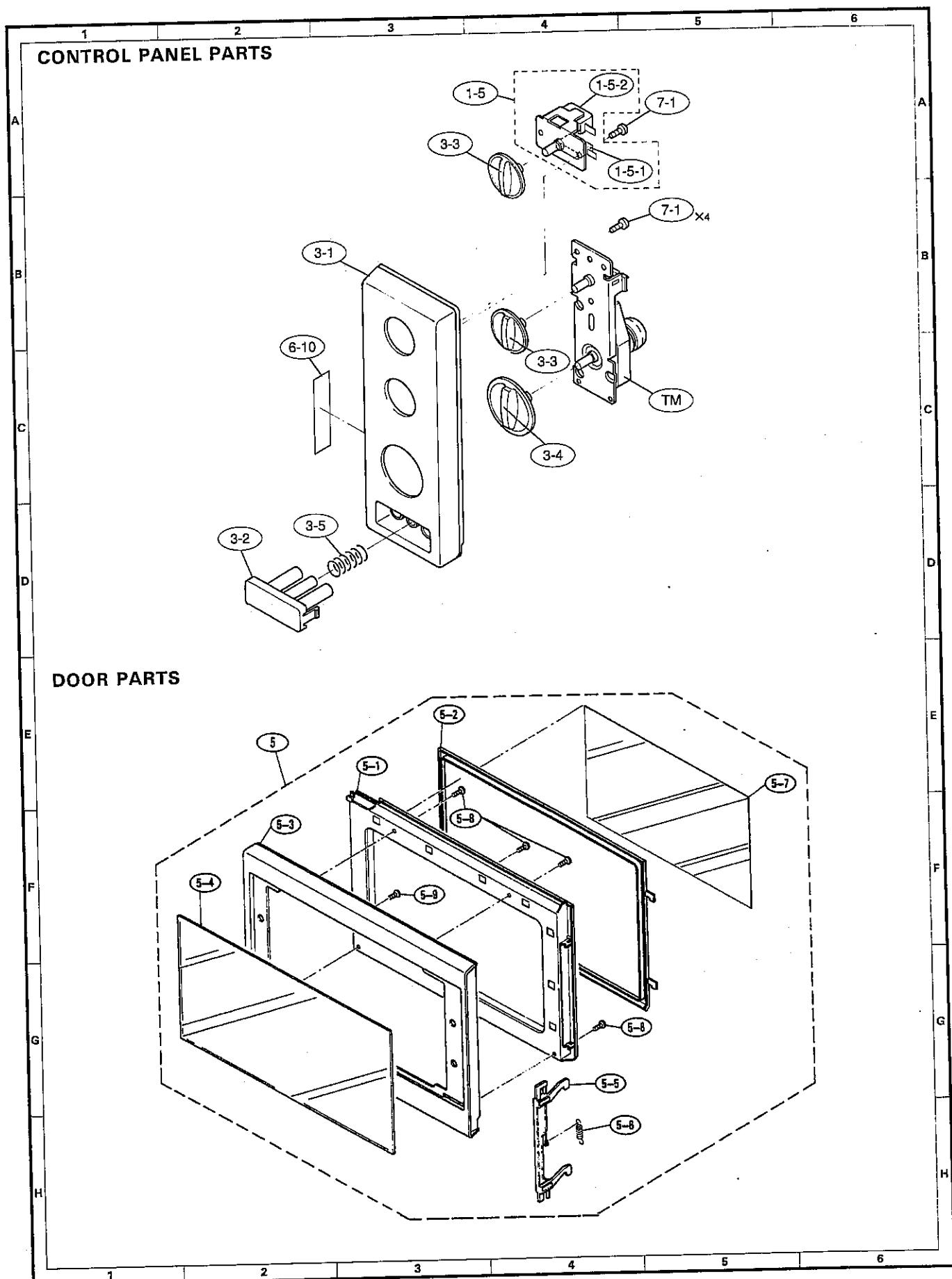
HOW TO ORDER REPLACEMENT PARTS

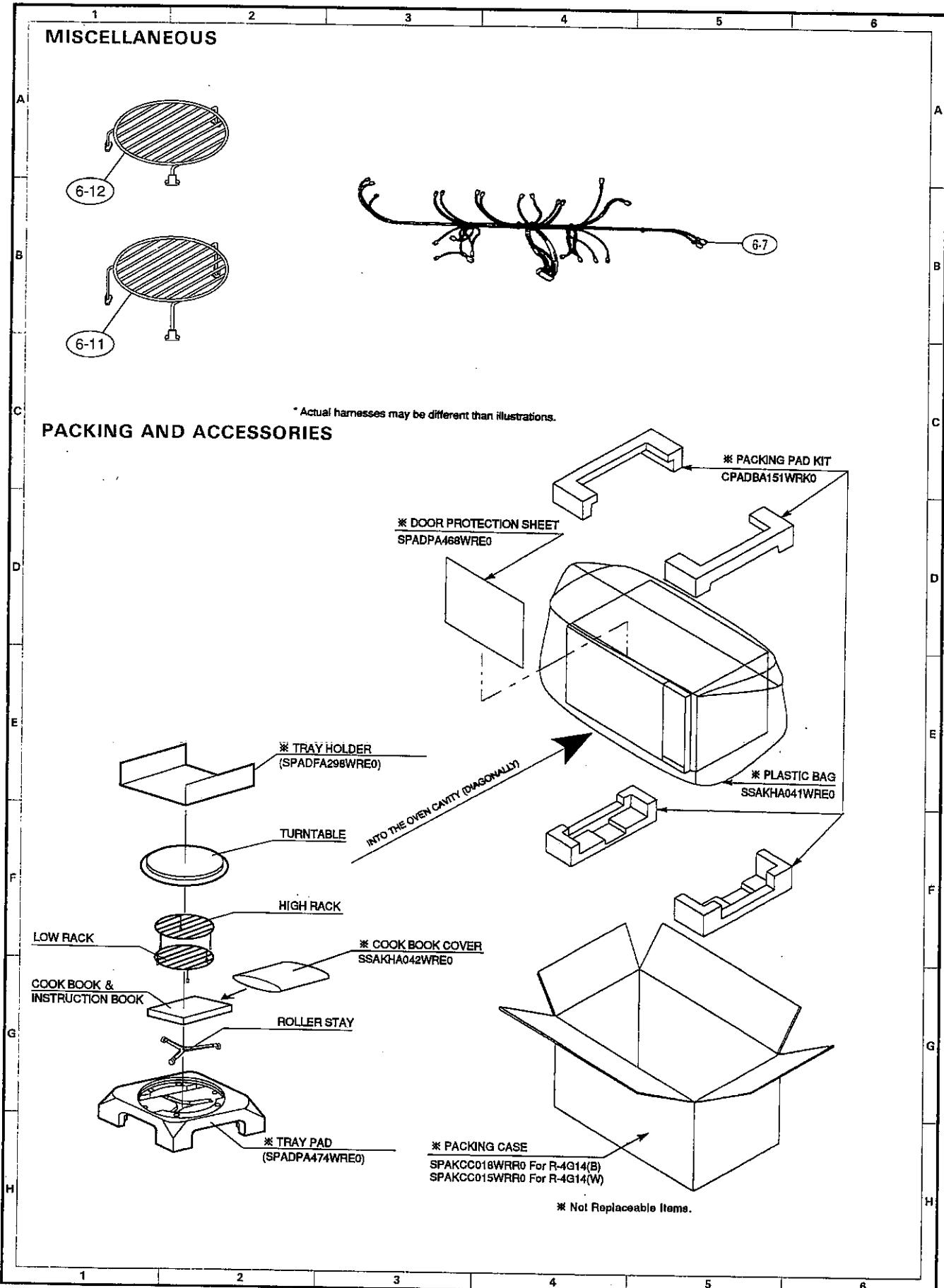
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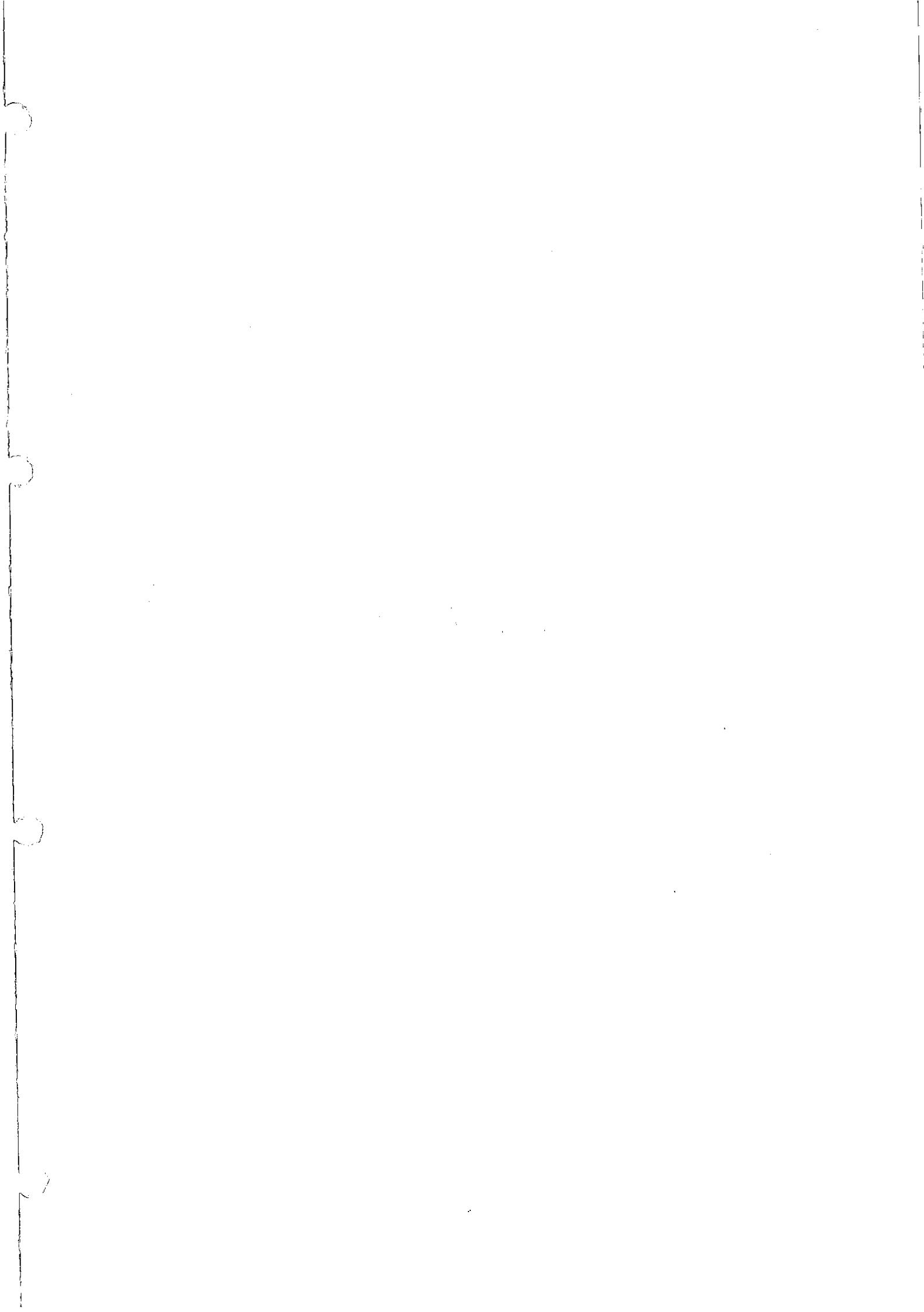
1. MODEL NUMBER	2. REF. NO.
3. PART NO.	4. DESCRIPTION

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